What is claimed is:

1. A process for the preparation of the α-crystal form of the methanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[4-pyridin-3-yl)pyrimidin-2-ylamino]phenyl]benzamide comprising:

f) carrying out the addition reaction of methanesulfonic acid and 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a solvent selected from the group consisting of C_2-C_6 aliphatic alcohols or the mixtures thereof, optionally with the addition of the other C_1-C_4 aliphatic alcohol;

g) adding, if necessary, a solvent selected from the group consisting of the esters of lower carboxylic acids and C_1-C_4 aliphatic alcohols;

h) optionally inoculating the reaction mixture with the α-crystal form;

i) stirring the reaction mixture for the time necessary for crystallization of the α-crystal form;

j) isolating the α-crystal form from the reaction mixture.

2. A process according to claim 1 in which the addition reaction is carried out using not more than

0.99 equivalent, especially from 0.95 to 0.99 equivalents of methanesulfonic acid per 1 equivalent of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide.

3. A process according to Claims 1-2, in which the addition reaction is carried out in an alcohol selected from the group comprising *n*-propyl alcohol, isopropyl alcohol, *n*-butyl alcohol, *tert*-butyl alcohol and the mixtures thereof with ethyl alcohol.

4. The method according to Claims 1-3 in which the addition reaction is carried out in the mixture containing from 0 to 50% of ethyl alcohol and from 50 to 100% of n-propyl alcohol (v/v).

5. The method according to Claims 1-3 in which the addition reaction is carried out in the mixture containing from 0 to 50% of ethyl alcohol and from 50 to 100% of isopropyl alcohol (v/v).

6. The method according to Claims 1-3 in which the addition reaction is carried out in the mixture containing from 0 to 50% of ethyl alcohol and from 50 to 100% of n-butyl alcohol.

7. The method according to Claims 1-3 in which the addition reaction is carried out in the mixture containing from 0 to 50% of ethyl alcohol and from 50 to 100% of *tert*-butyl alcohol.

8. A process according to claim 1 in which the addition reaction is carried out using 1 equivalent of

methanesulfonic acid per 1 equivalent of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide.

9. A process according to Claim 8 comprising:

a) the addition reaction of methanesulfonic acid and 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a solvent selected from the group consisting of C_2-C_6 aliphatic alcohols, optionally with the addition of the other C_1-C_4 aliphatic alcohol;

b) adding a solvent selected from the group consisting of the esters of lower carboxylic acids and C_1-C_4 aliphatic alcohols;

c) inoculating the reaction mixture with the α-crystal form;

d) stirring the reaction mixture for the time necessary for crystallization of the α-crystal form;

e) isolating the α-crystal form from the reaction mixture.

10. A process according to Claims 1-9 in which the addition reaction is carried out with stirring while maintaining internal temperature of the mixture within the range from room temperature to boiling temperature of the reaction mixture.

11. A process according to Claims 1-10 in which the α-crystal form of the methanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide thus obtained is essentially free of the β-crystal form of the methanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide or any other crystalline solids.

12. A process according to Claims 1-11 in which the α-crystal form of the methanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide thus obtained shows on X-ray powder diffraction diagram peaks at 2θ angles of approximately: 4.9; 18.6; 19.1; 23.2 and 28.6°, obtained for radiation of CuKα and the wavelength λ=1,54056 Å.

13. The method according to Claims 1-12 in which the α-crystal form of the methanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide thus obtained shows on X-ray powder diffraction diagram the peaks of relative intensity over 20% at 2θ angles of approx.: 10.5; 14.9; 16.5; 17.7; 18.1; 18.6; 19.1; 21.3; 21.6; 22.7; 23.2; 23.8; 24.9; 27.4; 28.0 and 28.6°.

14. Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide.

15. Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a crystalline form.

16. Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a crystalline Form I which shows on X-ray powder diffraction diagram obtained for radiation of CuKα at the wavelength λ=1.54056 Å peaks of relative intensity over 20% at 2θ angles about: 16.94, 19.80, 20.08, 20.51, 21.28, 21.65, 21.98, 22.70 and 23.07°.

16. Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a crystalline Form I according to Claim 15, characteristic in that its X-ray powder diffraction diagram obtained for radiation of CuKα at the wavelength λ=1.54056 Å is essentially identical with that presented on Fig. 8.

17. Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a crystalline Form II which shows on X-ray powder

diffraction diagram obtained for radiation of CuKα at the wavelength λ=1.54056 Å peaks of relative intensity over 20% at 2θ angles about: 17.23, 17.62, 18.72, 19.90, 20.23, 21.25, 21.59, 22.05, 22.44, 23.38, 23.68, 24.48, 25.41, 26.10 and 28.39°.

18. Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide in a crystalline Form II according to Claim 17, characteristic in that its X-ray powder diffraction diagram obtained for radiation of CuKα at the wavelength λ=1.54056 Å is essentially identical with that presented on Fig. 9.

19. A mixture of the crystalline Forms I and II of dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide which shows on X-ray powder diffraction diagram obtained for radiation of CuKα at the wavelength λ=1.54056 Å peaks of relative intensity over 20% at 2θ angles about: 16.91, 17.60, 18.69, 19.78, 20.50, 21.60, 22.00, 22.70, 23.07, 24.49, 26.13 and 27.25°.

20. The mixture of the crystal Forms I and II of Dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide according to Claim 19, characteristic in that its X-ray powder

diffraction diagram obtained for radiation of CuKα at the wavelength λ=1.54056 Å is essentially identical with that presented on Fig. 10.

21. The use of any of the crystalline form of dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide selected from the group comprising the Forms I and II and the mixtures thereof, for the preparation of a pharmaceutical composition having anti-neoplastic activity.

22. The pharmaceutical composition of dimethanesulfonic acid addition salt of 4-(4-methylpiperazin-1-ylmethyl)-N-[4-methyl-3-[(4-pyridin-3-yl)pyrimidin-2-ylamino)phenyl]benzamide selected from the group comprising the crystalline forms I and II and the mixtures thereof, together with the pharmaceutically acceptable carriers and/or excipients.